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CONTROL
Insect

Portland, Oregon

November 12, 1948

PLAN FOR CONTROL OF THE SPRUCE BUDWORM IN OREGON

The spruce budworm is seriously threatening the Douglas-fir and white fir timber stands of Oregon. Insect detection surveys just completed show budworm infestations covering 1,446,000 acres, mainly in the Blue Mountain area where this pest became serious last year. In 1948 a heavy outbreak, covering 103,000 acres, was discovered in the Oregon Cascades east of Mount Hood. Most significant, this year marks the beginning of heavy infestation in west-side Douglas-fir. This threatening outbreak is in the mountains east of Eugene.

The budworm is a front rank destroyer of fir and spruce forests in much of North America. It has caused widespread destruction of timber in the East with losses running into untold millions of dollars. If the outbreaks in Oregon are allowed to run unchecked, similar losses may occur here. An adequate control program is urgently needed to prevent the threatened losses and thereby conserve our fir timber supplies.

An action committee 1/ representing the timber land owners and the public timber managing agencies vitally affected has been formed to develop a control program. This committee presents the following report with analyzes the situation, and proposes a plan of action.

1/ The committee consists of representatives of the following agencies and organizations:

West Coast Lumbermen's Association
Western Pine Association
Western Forestry and Conservation Association
Willamette Valley Tree Farms
Weyerhaeuser Timber Company
Fischer Lumber Company
Oregon State Board of Forestry
U. S. Forest Service
U. S. Bureau of Land Management
U. S. Indian Service
U. S. Bureau of Entomology and Plant Quarantine
Oregon Extension Service

Control Recommendations

The committee recommends that control of the budworm be in the following order of priority:

1. Eugene area
2. Mount Hood area
3. Blue Mountains area
   a. Kinzua Unit
   b. Ukiah Unit
   c. Walla Walla Unit

As a first step in a comprehensive control program it is recommended that the Eugene and Mount Hood outbreaks be attacked in 1949. There are 100,000 acres requiring treatment on the Eugene area and 103,000 acres on the Mount Hood area. At an average cost of $2.00 per acre the total cost in 1949 would be $406,000.

It is proposed that the costs of control be divided as follows:

	Eugene area	Mt Hood area	Total
Federal government	$ 85,850	$174,820	$260,670
State of Oregon	76,700	16,230	92,930
Private owners	37,450	14,950	52,400
Total	$200,000	$206,000	$406,000

The basis for these recommendations is given in the following discussion and in a detailed technical report issued by the Bureau of Entomology and Plant Quarantine. 1/

Control Considerations

A large-scale experiment in central Oregon in 1948 conclusively demonstrated that the aerial application of one pound of DDT in one gallon of fuel oil per acre gives nearly perfect control of the budworm when properly timed. The cost of such control is estimated at $2.00 per acre. On this basis $3,000,000 would be required to cover the entire area known to be infested.

It would be desirable to suppress the entire outbreak immediately but there are technical difficulties that make such an undertaking impractical. Shortages of time and equipment are the principal limiting factors. Due to the habits of the insect, successful spraying is limited to a 10-day to 2-week period. On the basis of a canvass of available equipment and qualified operators, it is estimated that a maximum of 200,000 acres can be sprayed during the time available.

1/ Furniss, R. L., Buckhorn, W. J., and Wright, K. H. - Spruce Budworm in Oregon and Washington, Season of 1948. A mimeographed report dated November 1, 1948.

Treatment of the entire infested area may require several years. Therefore the infestation has been divided into control units, to be treated according to their importance. The order of treatment is based upon the following considerations:

1. Value of the timber stands now infested or immediately threatened.
   a. Quality
   b. Volume of susceptible species
   c. Accessibility
   d. Recreational use

2. Factors influencing effectiveness of control.
   a. Isolation with respect to other infested areas
   b. Size of infested unit
   c. Physical suitability for control - general accessibility, available airstrips, character of terrain

3. Status of infestation
   a. Present destructiveness
   b. Possibilities of spread

Description of Infested Areas

Eugene Area - The infestation is in the heart of one of the most important timber producing areas in Oregon. The affected stands are largely second growth Douglas-fir which are urgently needed for maintained operation of the forest industries of the area. Average volume is about 20,000 board feet per acre. At an average stumpage value of $10.00 per thousand board feet the total value of the currently infested timber is at least $20,000,000. The infestation is completely isolated from other infested areas thus reducing the chance of reinfestation from outside sources following treatment. The size, 100,000 acres, is well within practical limits for control. Defoliation has weakened the attacked trees to the point that another year of heavy feeding is likely to kill much timber. Unless control is promptly undertaken this outbreak may soon become too large for practical control.

Mount Hood Area - The infested stands on the Mount Hood area are of the mixed fir-ponderosa pine type. The composite Douglas-fir and white fir volume ranges from 3,000 to 20,000 with an average of about 5,000 board feet per acre. To the westward and northward the Douglas-fir and white fir stands are of much greater volume and higher quality. Some of the better stands are already infested. At an average stumpage value of $3.00 per thousand board feet the total value of the susceptible species on the 103,000 acres currently infested is approximately $1,500,000. The area is of practical size for treatment and conditions are generally favorable for control. The defoliated trees have been weakened to the point that killing is probable in 1949. There is no natural barrier to prevent spread into the more valuable stands to the west. Furthermore, the possibility of spread into western Oregon cannot be completely discounted. The Mount Hood recreational area which is threatened by this infestation is sufficiently valuable in itself to warrant prompt control measures.

Blue Mountains Area - In general the budworm situation in the Blue Mountains is one problem. There are 1,243,000 acres of recorded infestation. Douglas-fir and white fir together average some 3,000 to 4,000 board feet per acre. At an average stumpage value of $3.00 per thousand the total value of the infested timber is at least $10,000,000. In addition to the recorded extent of infestation, it is believed that the budworm is present in small numbers in practically all fir stands in the Blue Mountains. The infested blocks are very large and are not well isolated, which means that control will have to be conducted on an extensive basis to minimize the risk of immediate reinfestation. All stands, both infested and uninfested, are of approximately the same value.

For control purposes the Blue Mountains area is subdivided into three main units: (1) Kinzua, (2) Ukiah, and (3) Walla Walla. The Kinzua unit is given first consideration because it is a timber-shortage area, so far as maintenance of the local lumber industry is concerned. The Kinzua unit is isolated, except to the east where it joins the Ukiah unit. In setting up the Kinzua unit the logical break is at Wall Creek. The Ukiah unit is given second priority in the Blue Mountains on the basis of timber values. Furthermore, treatment of this area should closely follow treatment of the Kinzua unit to prevent reinfestation of the latter. On the Walla Walla unit there are extensive stands of low value on difficult terrain. These stands are of lowest priority in the spraying program.

Infestation and Ownership Data

The intensity of infestation and the ownership of the infested areas is given in Tables No. 1 and 2 which appear at the end of this report.

Plan of Control and Cooperation

In apportioning the costs of control it is recognized that the value of the timber now infested is minor in comparison to the values that are threatened with spread of the budworm. Thus the public has more at stake and a greater responsibility than the individual owners. It is appropriate, therefore, that the public pay the greater share of the costs of control. It is likewise appropriate that the public agency having dominant ownership should pay the major part of the costs. For the projects to be undertaken in 1949, it is proposed:

1. That the public agencies pay the entire cost of treatment on publicly owned lands.
2. That private owners pay 25% of the cost of treatment of their lands.
3. That 50% of the cost of treatment of private lands be borne by the public agency primarily concerned and the remaining 25% by the public agency having the secondary interest.

Eugene Area - It is proposed that this project be set up and administered by the State Forester with the technical assistance of the Bureau of Entomology and Plant Quarantine and the financial help of the Bureau of Land Management, the U. S. Forest Service, and private owners. Under this setup the Oregon Insect Pest Control Law would be

applied and the State would be responsible for collections from the several hundred owners of private land. Costs, figured on the basis of 100,000 infested acres to be treated, are as follows:

Federal

100% on 24,200 acres of federal land		
O & C lands -	- 15,200 Acres	$30,400
National Forest lands	- 9,000 Acres	18,000
	Subtotal	$48,400
25% on 74,900 acres of private land		37,450
	Subtotal	$85,850

State

100% on 900 acres of county land	$ 1,800
50% on 74,900 acres of private land	74,900
	$76,700

Private

25% on 74,900 acres of private land	$37,450
TOTAL	$200,000

Mount Hood Area - It is proposed that this project be set up and administered by the U. S. Forest Service and that a zone of infestation be established by the State Forester under the Oregon Insect Pest Control Law to enable the collection of funds from private owners. Under this setup the State would collect from the private owners. Technical supervision would be furnished by the Bureau of Entomology and Plant Quarantine. Costs, figured on the basis of 103,000 infested acres to be treated, are as follows:

Federal

100% on 72,460 acres of National Forest land	$144,920
50% on 29,900 acres of private land	29,900
Subtotal	$174,820

State

100% on 640 acres of State land	1,280
25% on 29,900 acres of private land	14,950
Subtotal	$ 16,230

Private

25% on 29,900 acres of private land	$ 14,950
TOTAL	$206,000

In carrying out the proposed control program it is essential that funds be set up on a calendar year rather than a fiscal year basis. This is necessary because control and the checking of results will begin in the fiscal year year 1949 and extend into the fiscal year 1950.

TABLE NO. 1

SUMMARY OF SPRUCE BUDWORM SITUATION BY INTENSITY OF INFESTATION - SEASON OF 1948

	INTENSITY OF INFESTATION									
	Light		Moderate		Heavy		Very Heavy		Total	
	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
BLUE MOUNTAINS AREA										
Kinzua Unit	19,800	11.7	19,200	11.4	88,000	52.1	42,000	24.8	169,000	100
Ukiah Unit	89,400	24.8	188,800	52.5	33,800	9.4	48,000	13.3	360,000	100
Walla Walla Unit	140,000	19.6	326,500	45.7	134,500	18.9	113,000	15.8	714,000	100
Subtotal	249,200	20.0	534,500	42.9	256,300	20.7	203,000	16.4	1,243,000	100
MOUNT HOOD AREA										
Mount Hood Unit	69,000	67.1	28,300	27.4	5,700	5.5			103,000	100
EUGENE AREA										
Eugene Unit	30,200	30.2	50,800	50.8	19,000	19.0			100,000	100
TOTAL	348,400	24.0	613,600	42.4	281,000	19.4	203,000	14.2	1,446,000	100

*

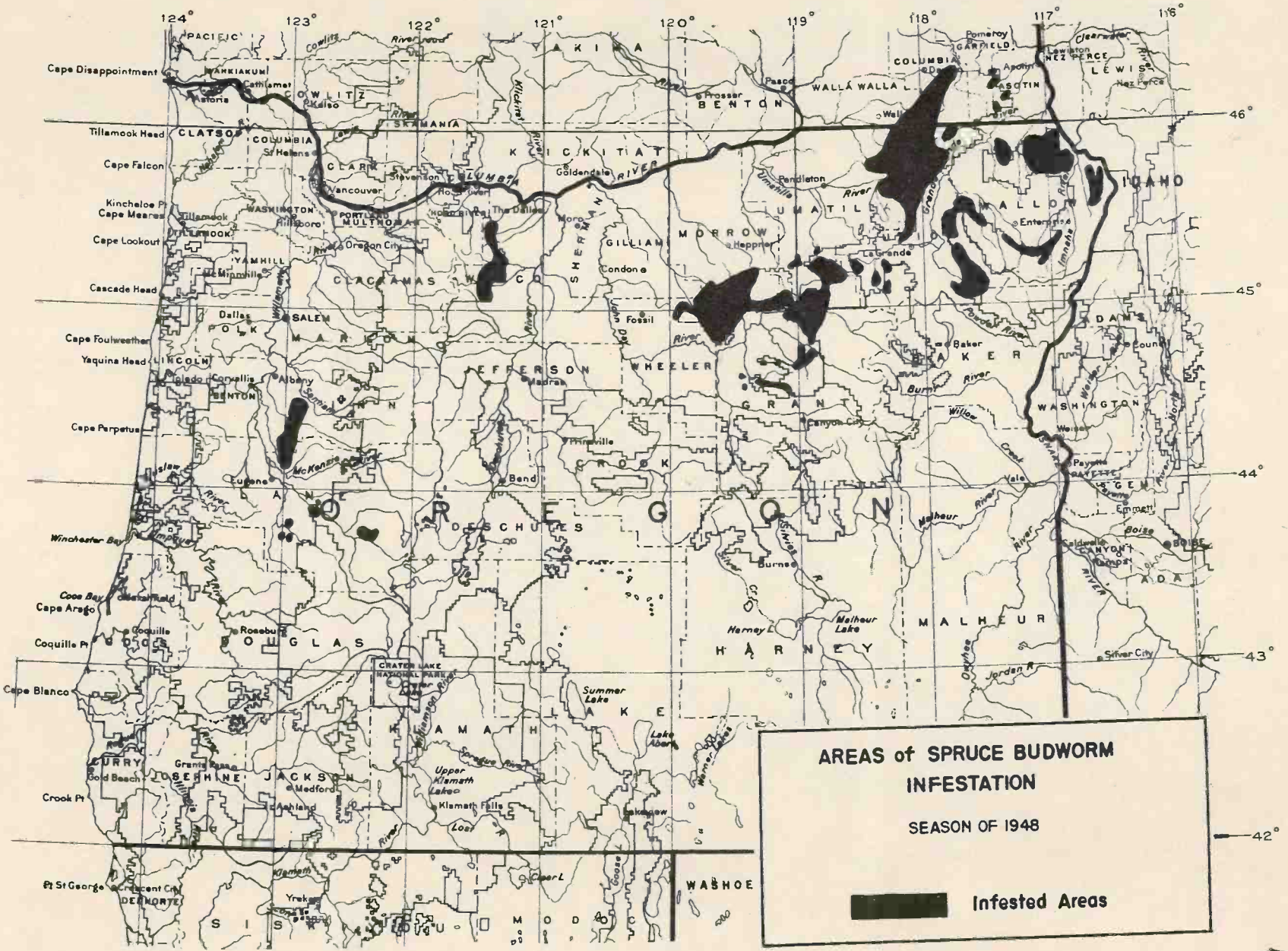
* Light - Defoliation light, mostly on current growth.
Moderate - Defoliation moderate. No mortality expected for at least one year.
Heavy - Defoliation moderate to severe. Light current mortality. Heavy mortality probable next year.
Very Heavy - Defoliation severe. General mortality in progress.

TABLE NO. 2

SUMMARY OF SPRUCE BUDWORM SITUATION BY OWNERSHIP CLASSES - SEASON OF 1948

	OWNERSHIP									
	Federal		State		County		Private		Total	
Locality	Acres	%	Acres	%	Acres	%	Acres	%	Acres	%
BLUE MOUNTAINS AREA										
Kinzua Unit	80,760	47.8	640	0.4	3,140	1.9	84,460	49.9	169,000	100
Ukiah Unit	197,380	54.8	2,680	0.7	6,020	1.7	153,920	42.8	360,000	100
Walla Walla Unit	380,890	53.5	6,710	0.9	12,680	1.8	313,720	43.8	714,000	100
Subtotal	659,030	53.0	10,030	0.8	21,840	1.8	552,100	44.4	1,243,000	100
MOUNT HOOD AREA										
Mount Hood Unit	72,460	70.3	640	0.7			29,900	29.0	103,000	100
EUGENE AREA										
Eugene Unit	24,200*	24.2			900	0.9	74,900	74.9	100,000	100
TOTAL	755,690	52.3	10,670	0.7	22,740	1.6	656,900	45.4	1,446,000	100

* Bureau of Land Management -- 15,200 Acres
Forest Service -- 9,000 Acres


AREAS of SPRUCE BUDWORM INFESTATION
SEASON OF 1948
Infested Areas
MILES
0
50
100
1939
BASE BY U.S.G.S.
OREGON
IDAHO
WASHINGTON
CALIFORNIA
NEVADA
Cape Disappointment
Tillamook Head
Cape Falcon
Kincheloe Pt
Cape Meares
Cape Lookout
Cascade Head
Cape Foulweather
Yaquina Head
Cape Perpetus
Winchester Bay
Coos Bay
Cape Arago
Coquille Pt
Cape Blanco
Crook Pt
Pt St George
Crescent City
Astoria
Cathlamet
Kelso
Vancouver
Stevenson
Portland
Hillsboro
Tillamook
Oregon City
McMinnville
Salem
Dallas
Albany
Corvallis
Toledo
Eugene
Florence
Reedsport
Coquille
Roseburg
Gold Beach
Grants Pass
Medford
Ashland
Klamath Falls
Lakeview
Yreka
Weed
Alturas
Madras
Prineville
Bend
Fossil
Condon
Heppner
The Dalles
Moro
Hood River
Goldendale
Pasco
Prosser
Wallula
Walla Walla
Pendleton
La Grande
Enterprise
Baker
Burns
Canyon City
Ontario
Payette
Weiser
Emmett
Boise
Caldwell
Nampa
Silver City
Harney L.
Malheur Lake
Summer Lake
Lake Abert
Upper Klamath Lake
Crater Lake National Park
Pomeroy
Clarkston
Lewiston
Asotin
Grangeville
Orofino
Moscow
Salmon
Challis
Mackay
Arco
Idaho Falls
Pocatello
Blackfoot
Rexburg
Driggs
Jackson
Afton
Star Valley
Kemmerer
Evanston
Lyman
Green River
Rock Springs
Wamsutter
Rawlins
Baggs
Saratoga
Encampment
Riverside
Walcott
Laramie
Cheyenne
Wheatland
Douglas
Lusk
Torrington
Scottsbluff
Gering
Alliance
Chadron
Hay Springs
Crawford
Harrison
Hemingford
Gordon
Rushville
Gordon
Valentine
Merriman
Ainsworth
Long Pine
Bassett
Newport
Dallas
Albany
Corvallis
Toledo
Eugene
Florence
Reedsport
Coquille
Roseburg
Gold Beach
Grants Pass
Medford
Ashland
Klamath Falls
Lakeview
Yreka
Weed
Alturas
Madras
Prineville
Bend
Fossil
Condon
Heppner
The Dalles
Moro
Hood River
Goldendale
Pasco
Prosser
Wallula
Walla Walla
Pendleton
La Grande
Enterprise
Baker
Burns
Canyon City
Ontario
Payette
Weiser
Emmett
Boise
Caldwell
Nampa
Silver City
Harney L.
Malheur Lake
Summer Lake
Lake Abert
Upper Klamath Lake
Crater Lake National Park
Pomeroy
Clarkston
Lewiston
Asotin
Grangeville
Orofino
Moscow
Salmon
Challis
Mackay
Arco
Idaho Falls
Pocatello
Blackfoot
Rexburg
Driggs
Jackson
Afton
Star Valley
Kemmerer
Evanston
Lyman
Green River
Rock Springs
Wamsutter
Rawlins
Baggs
Saratoga
Encampment
Riverside
Walcott
Laramie
Cheyenne
Wheatland
Douglas
Lusk
Torrington
Scottsbluff
Gering
Alliance
Chadron
Hay Springs
Crawford
Harrison
Hemingford
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Rushville
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Valentine
Merriman
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Bassett
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118°
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116°
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44°
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